In re application of WILLIAMS ET AL.
Serial No. 09/849,170

REMARKS

The Office action has been carefully considered. Claims 1-22 were pending in the application. The Office action rejected claims 1-22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,188,392 to O'Connor et al ("O'Connor") in view of Japan Pub. No.: 07-261906 to Watanabe et al ("Watanabe"). Applicants respectfully traverse these rejections.

Applicants thanks the Examiner for the interview held (by telephone) on June 16, 2004. During the interview, the Examiner and applicant's attorney discussed the claims with respect to the prior art. The essence of applicant's position is incorporated in the remarks below.

Applicants' technique is generally directed towards providing thickness information for digital ink. To this end, applicants may use a thickness conversion component that converts movement of a pen across a surface or tilting of a pen into thickness information for digital ink data. The pen in applicants' technique may include at least one accelerometer that is used to generate either ballistic movement or ballistic pen tilting information. For example, the accelerometer generates the movement or tilt information in the form of pulses, the width of each pulse being directly related to the acceleration of the pen movements or the tilt of the pen, respectively. The thickness conversion component converts the acceleration information, with or without additional information such as coordinate information, available pressure information, pen angle information, and vector information, into thickness

information for digital ink. This thickness information may be used to generate variably thick lines, which may be useful for a variety of applications, for example, better display and improved recognition. Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

O'Connor, in general, is directed toward a marking device that has a tip for contacting a surface. The marking device has a pressure sensor configured to detect when the tip of the marking device contacts the surface. Additionally, the marking device includes two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a Cartesian coordinate system. The system and technique disclosed by O'Connor is significantly different from applicants' and, furthermore, is not used to generate line thickness information. In O'Connor, the acceleration of the tip in the X and Y directions, the information from the pressure sensor and the temporal information related to sampling of the acceleration sensors are used to decompose the handwriting motion into a two-dimensional process for simplifying character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) Figure 4 of O'Connor illustrates mounting the acceleration sensors so that their normals are perpendicular to each other and are also between perpendicular to parallel to the plane of surface normal when the pen is held at a common inclination angle. (O'Connor, column 7, lines 6-29.) This allows simple detection of acceleration in two dimensions along the writing surface for character recognition.

In contrast to the claims of the present invention, the acceleration information of O'Connor is used to simplify character recognition in two dimensions along a writing surface and is not used to generate line thickness information as claimed by applicants. Moreover, the marking device of O'Connor includes two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a Cartesian coordinate system. Applicants' technique may use only one accelerometer for generate either pen movement or pen tilting information for generating line thickness information as claimed by applicants. Furthermore, O'Connor does not disclose a conversion component that utilizes the acceleration information to generate line thickness information as claimed by applicants. Nor does O'Connor disclose any process for conversion of movement information to thickness information as disclosed and claimed by applicants. Rather, O'Connor describes using acceleration and pressure information for decomposing handwriting motion into a two-dimensional process to simplify character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) Each and every one of these differences is significant.

Like O'Connor, Watanabe is directed toward a pen that has a tip for contacting a surface, and the pen has a pressure sensor configured to detect when the tip of the pen contacts the surface. In specific, Watanabe describes a pressure sensor constructed of a conductive rubber between a mobile electrode and a fixed electrode to determine line thickness. The movable electrode may move up and down corresponding to the change of the tip of the pen according to

the writing pressure applied. A pen controller may detect the writing pressure of the tip from the pressure sensor and outputs an electrical signal intermittently. See the Abstract of Watanabe and sections 0005-0018. Applicants' technique, on the other hand, may use only one accelerometer for generate either pen movement or pen tilting information for generating line thickness information as claimed by applicants. Watanabe does not use pen movement information for generating line thickness information but, rather, uses a pressure sensor. Furthermore, Watanabe does not disclose a conversion component that utilizes the acceleration information to generate line thickness information as claimed by applicants. Nor does Watanabe disclose any process for conversion of movement information to thickness information as disclosed and claimed by applicants.

Turning first to independent claim 1, applicants recite the limitations of "a writing instrument that generates movement information including acceleration information from a user's handwriting" and "a conversion component that utilizes the acceleration information to generate line thickness information." Applicants' technique may use a thickness conversion component that converts movement of a pen across a surface or tilting of a pen into thickness information for digital ink data. The pen in applicants' technique may include at least one accelerometer that is used to generate either pen movement or pen tilting information. The cited sections of O'Connor do not disclose any such limitations as alleged by the Office Action. Instead, O'Connor describes a marking device with two acceleration sensors configured adjacent to the tip for detecting

acceleration of the tip in the X and Y directions of a Cartesian coordinate system. The marking device includes a conversion device that merely performs analog to digital signal conversion of acceleration and pressure information for transmitting to a personal computer or data processing device. The cited sections of O'Connor do not disclose any thickness conversion component. Nowhere in O'Connor is there any description of a thickness conversion component. Nor can there be found anywhere in O'Connor any description of a process to convert movement information to thickness information as disclosed by applicants. Instead, O'Connor significantly describes using the acceleration of the tip in the X and Y directions, the information from the pressure sensor and the temporal information related to sampling of the acceleration sensors to decompose the handwriting motion into a two-dimensional process for simplifying character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) Nor do the cited sections of Watanabe disclose a thickness conversion component that utilizes acceleration information to generate line thickness. Instead, Watanabe uses a pressure sensor to generate line thickness and does not disclose using pen movement information for generating line thickness information.

Similarly, applicants respectfully submit that dependent claims 2-8 are not anticipated by O'Connor or Watanabe, whether considered alone or in any permissible combination. Each of the dependent claims includes the limitations of "a writing instrument that generates movement information including acceleration information from a user's handwriting" and "a conversion component

that utilizes the acceleration information to generate line thickness information" as recited in independent claim 1. As discussed above, O'Connor and Watanabe, whether considered alone or in any permissible combination, fail to disclose these limitations. In addition to the limitations noted above, each of these dependent claims includes additional patentable elements.

For example, claim 8 recites that an "accelerometer is configured to generate tilt information." In applicants' technique, a thickness conversion component may convert information of tilting of a pen into thickness information for digital ink data. The pen in applicants' technique may include at least one accelerometer that is used to generate pen tilting information that is received by the thickness conversion component. Nowhere in O'Connor is this limitation disclosed. Instead, O'Connor describes mounting two acceleration sensors so that their normals are perpendicular to each other and are also between perpendicular to parallel to the plane of surface normal when the pen is held at a common inclination angle. (O'Connor, column 7, lines 6-29.) This allows O'Connor to perform simple detection of acceleration in two dimensions along the writing surface for character recognition.

Likewise, applicants respectfully submit that independent claims 9 and 18, and dependent claims 10-17 and 19-22 are not anticipated by O'Connor or Watanabe, whether considered alone or in any permissible combination. Each of the dependent claims includes the limitations of a writing instrument that generates movement information including acceleration information from a user's handwriting and a conversion component that utilizes the acceleration

information to generate line thickness information. As discussed above, O'Connor and Watanabe, whether considered alone or in any permissible combination, fail to disclose these limitations. In addition to the limitations noted above, each of these dependent claims includes additional patentable elements.

For example, claim 12 alternatively recites "the conversion component generates thickness information based upon wavelengths of the movement information." And claim 17 further recites "the movement information comprises tilt information." There is no mention of a conversion component for generating thickness information in O'Connor, nor does Watanabe disclose a conversion component that utilizes the acceleration information to generate line thickness information as claimed by applicants. Rather, O'Connor is instead directed to overcoming the problem of providing an input device with accurate detection of the two dimensional motion of the tip of the pen on the writing surface for accurate recognition of input text or graphics, as described in the background section of O'Connor. (O'Connor, column 2, lines 42-46.) And Watanabe does not use pen movement information for generating line thickness information but, rather, uses a pressure sensor.

For at least these significant reasons, applicants submit that all the claims are patentable over the prior art of record. Further, by law, in order to modify a reference to reject claimed subject matter, there must be some teaching or suggestion outside of applicants' teachings to do so. O'Connor does not have any such teachings or suggestions as to any such modification, let alone any teaching or suggestion as to how his system could be modified, or why it might

be desirable to do so. In specific, the motivation described by O'Connor for providing his marking device with two acceleration sensors is to use the acceleration and pressure information for decomposing handwriting motion into a two-dimensional process to simplify character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) In accord with his stated purpose, O'Connor includes two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a Cartesian coordinate system and, further, teaches mounting the acceleration sensors so that their normals are perpendicular to each other and are also between perpendicular to parallel to the plane of surface normal when the pen is held at a common inclination angle. (O'Connor, column 7, lines 6-29.) This allows simple detection of acceleration in two dimensions along the writing surface for character recognition. The only other way in which O'Connor could be modified to reach applicants' claimed invention is via applicants' own teachings, which is impermissible by law.

For at least these additional reasons, applicants submit that all the claims are patentable over the prior art of record, whether considered alone or in any permissible combination. Reconsideration and withdrawal of the rejections in the Office Action is respectfully requested and early allowance of this application is earnestly solicited.

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Conclusion

In view of the foregoing remarks, it is respectfully submitted that claims 1-22 of the present application are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this Amendment, along with transmittal and facsimile cover sheet, are being transmitted by facsimile to the United States Patent and Trademark Office in accordance with 37 C.F.R. 1.6(d) on the date shown below:

Date: June 29, 2004

Albert S. Michalik

2730 Response